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If the space be nearer to the station, or if the difference in density be more than 1-100th part, these deflections must be multiplied by a corresponding quantity.

7. The paper is concluded by a revision of some of the calculations in the former communication. The mass of the mountain region above the level of the plains is shown to be somewhat more than four-millionths of the mass of the earth.

III. "On the Thermal Effects of Compressing Fluids." By J. P. JOULE, LL.D., F.R.S. &c. Received October 9, 1858.

(Abstract.)

The author in this paper gives an experimental demonstration of the correctness of Professor Thomson's formula, $\theta = \frac{Tep}{JK}$, where θ is the thermal effect, T the temperature from absolute zero, e the expansibility by heat, p the pressure, J the mechanical equivalent of the thermal unit, and K the capacity for heat. The fluids experimented on were water and oil, with the results tabulated below:—

	Temperature of the liquid.	Pressure applied in atmospheres.	Experimental result.	Theoretical result.
Water...	1.2 Cent.	25.34	-0.0083	-0.0071
	5	25.34	0.0044	0.0027
	11.69	25.34	0.0205	0.0197
	18.38	25.34	0.0314	0.0340
	30	25.34	0.0544	0.0563
	31.37	15.64	0.0394	0.0353
	40.4	15.64	0.0450	0.0476
Oil	16	7.92	0.0792	0.0886
	17.29	15.64	0.1686	0.1758
	16.27	25.34	0.2663	0.2837

IV. "Note on Archdeacon PRATT's paper on the Effect of Local Attraction on the English Arc." By Captain CLARKE, R.E. Communicated by Lieut.-Colonel JAMES, R.E. Received June 30, 1858.

The following letter of Colonel James will explain the nature of this communication; the numerical statements, being not susceptible